Canada-Wide Differential GPS Service

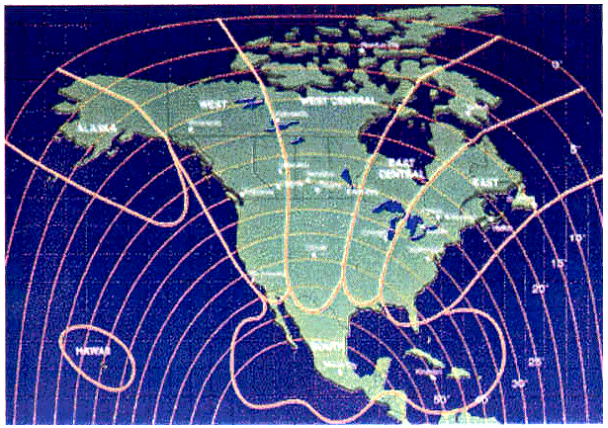
Canada is implementing the delivery of a free national real-time differential GPS correction service covering the entire country and beyond.

Delivery

The corrections will be provided through a broadcast using the MSAT-1 communication satellite The broadcast signal will be openly available. The GPS corrections will be broadcast in a modified RTCA format, but the radio receivers under development will output RTCA and RTCM-SC104 formats, thereby working with many existing GPS receivers. The CDGPS receiver will also output positions in NMEA format for PC based applications using the internal GPS receiver.

Coverage

The signal will be transmitted over four MSAT-1 beams, providing complete coverage over Canada and parts of the U.S.



Specifications

- National Coverage
- GPS•C, RTCM and NMEA Standard output
- Lightweight (<500 grams)
- Simple Operation
- Low Power Consumption (10 hours on 4 AA batteries)
- Open Published Broadcast Protocol
- Approximate initial cost of CDGPS receiver—$1500 one time cost—no subscription fees

Reference Stations

The GPS corrections (GPS•C) are generated from real-time feeds of GPS data observed across Canada, therefore allowing accurate interpolation of corrections nationally.

Reference stations locations are located at:

- Albert Head, BC
- Priddis, AB
- Yellowknife, NT
- Whitehorse, YT
- Churchill, MB
- Winnipeg, MB
- Algonquin Park, ON
- Ottawa, ON
- Schefferville, QC
- Fredricton, NB
- St. John's, NF
- Washington, DC (USA)

Additional stations will be added as necessary. GPS•C is based on the Canadian Active Control System, both of which are designed and operated by Natural Resources Canada.

For more information please contact the nearest CDGPS partner office (see http://cdgps.com) or contact the project office at:

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Victoria BC V8W 9M2

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CDGPS Canada-wide DGPS Service

. . . providing accurate, reliable GPS corrections for metre-level positioning for all of Canada.

Partnership

All ten provinces, the government of Nunavut and the federal government (including GeoConnections) are collaborating in a partnership to deliver a national, real-time differential GPS (DGPS) service.

By leveraging the work of British Columbia in delivering corrections over the MSAT-1 satellite and utilizing Natural Resources Canada's core GPS tracking infrastructure, the cost to implement a national DGPS service is being minimized.

Provincial, territorial and federal governments realize the benefits of a national system by investing significantly less individually than would be required to create regional solutions.

Infrastructure

A national DGPS service allows information to be collected using GPS to a standard accuracy and datum. The system is based on the Canadian Active Control System, which enables GPS observations to be easily related to the CSRS.

By having information related to the national referencing system, information becomes easier to integrate, share and use. This technology makes it simple for all spatial information producers and maintainers to accurately reference their information.

As with other important infrastructures, this national DGPS services is available to all. Although a terminal is required to access the service, the signal is provided as a **free service.**

New Opportunities

By providing corrections in real-time, applications can be developed that were not possible in the past. Not only does the system reduce the processing time traditionally related to high accuracy GPS positioning, it also enables new applications requiring ***accurate and reliable*** real-time positioning. Applications range from accurate vehicle navigation to precision farming and forestry.

Being a national service, applications can be developed to target a national market. Companies that operate across the country can use a single system to meet their positioning needs. Through the open published broadcast protocol industry is encouraged to take advantage of the free correction signal and develop value-added services.

Accuracy

CDGPS will provide positioning capability from a few decimetres to 5m at 95% across Canada, except for the high Arctic.

Accuracy is dependent on a number of factors, including the quality of the user's GPS receiver, GPS sky view, local conditions such as multipath, MSAT reception, etc.

By using this service, users will ensure that their work is consistent with the Canadian Spatial Reference System (CSRS).

NRCan's Geodetic Survey Division is continually striving to improve the accuracy of GPS·C, which will be reflected in the CDGPS service capability.

Schedule

Development has been underway on the program since mid-2000. The system will be operational by the Spring of 2002.

Funding has been committed to operate the service for three years from implementation. The number of users relying on the service, advancements in GPS, digital distribution technologies, and positioning technologies in general will be closely monitored throughout the three year period so that appropriate decisions can be made to extend the life of the service.

Receivers

As part of the development of the service, a number of terminals are being produced for use by government and the public marketplace. Terminal distribution to the public through private distributors are being put in place.

The open and free data distribution of the correction data over MSAT-1 allows other companies to use the signal and develop their own receiver or terminals to address their specific applications and marketplace needs.

Efficiency

By using this national DGPS service, users will free up GPS receivers currently being used as base stations, and will eliminate post-mission processing time. They will know they are receiving corrections in the field, thereby eliminating possible return trips, at significant expense.